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IN THE U.S. PATENT AND TRADEMARK OFFICE

In re: Patent Application of :
Joseph R. CHILD :
Serial No.: n/a : Group Art Unit:
Filed: Herewith : Examiner:

For: **FREE SPACE OPTICAL COMMUNICATION NETWORK AND STATIONS
THEREOF**

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Prior to examination on the merits, please amend claims 4-10, 12-16, 20-26 and 28-31 as follows:

4. (amended) The network of claim 1 wherein at least one of the plural optical stations is a relay station for (a) detecting the destination station identifier in messages that the relay station receives, and (b) relaying the message toward the destination station in response to the detected identifier, the relay station being incapable of responding to the data portion of the message.

5. (amended) The network of claim 1 wherein at least some of the plural optical stations arranged for performing (a), (b) and (c) are end user stations.

6. (amended) The network of claim 1 wherein some of the optical stations are mobile.

7. (amended) The network of claim 1 wherein each of the optical stations is arranged for transmitting each message on a monochromatic carrier having a

particular wavelength, each of the optical stations including a receive array associated with or without a filter arrangement for passing the wavelength to detectors of the receive array and preventing other wavelengths from substantially affecting the detectors of the receive array.

8. (amended) The network of claim 1 wherein each of the optical stations is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, each of the optical stations including a transmit array associated with a filter arrangement for (a) passing the wavelength to free space from emitters of the transmit array and (b) preventing other wavelengths from substantially affecting the emitters of the transmit array.

9. (amended) The network of claim 1 wherein each of the optical stations includes a transmit array and a receive array, the transmit and receive arrays of a particular optical station being at different locations so that photons emitted from the transmit array at the particular optical station do not interfere with signals arriving at detectors of the receive array at the particular optical station.

10. (amended) The network of claim 1 wherein each of the optical stations includes a transmitter array and a receive array, the transmit and receive arrays at any particular optical station being associated with plural beams, some of the plural beams of one optical station being arranged to be coupled with more than one of the other optical stations of the network.

12. (amended) The network of claim 1 wherein the optical stations are arranged so there are plural optical links among some of the optical stations, each of the plural optical links between some of the optical stations including different intermediate optical stations for relaying messages from an originating optical station to a designated destination optical station.

13. (amended) The network of claim 1 wherein the optical stations are arranged so each beam incident on a receiving optical station includes rays essentially parallel, each optical station including (a) an array of optical detectors arranged in detector areas and (b) an optical element for focusing each beam incident on one detector area of the receiving optical station.

14. (amended) The network of claim 1 wherein each optical station includes a transmit array of optical emitters for emitting optical beams, and an optical element for causing each emitted beam to diverge slightly as it travels through free space, the emitters and optical arrangement being arranged so that beams derived from different emitters of the same emitting array can propagate to different optical receiving stations.

15. (amended) The network of claim 1 wherein each optical station includes a receive array having many avalanche photodiodes.

16. (amended) The network of claim 1 wherein each optical station includes a transmit array including many optical emitters each having an associated beam and a receive array including many optical detector areas each having an associated beam, the beam of a detector area of a receiver optical station corresponding with the beam of an emitter of transmitter optical station.

20. (amended) The station of claim 17 wherein the optical station is a relay station for (a) detecting if the destination station identifier in messages that the relay station receives.

21. (amended) The station of claim 17 wherein the optical station is an end user station.

22. (amended) The station of claim 17 wherein the optical station is mobile.

23. (amended) The station of claim 17 wherein the optical station is

arranged for transmitting each message on a monochromatic carrier having a particular wavelength, the optical station including a receive array associated with a filter arrangement for passing the wavelength to detectors of the receive array and preventing other wavelengths from substantially affecting the detectors of the receive array.

24. (amended) The station of claim 17 wherein the optical station is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, the optical station including a transmit array associated with a filter arrangement for (a) passing the wavelength to free space from emitters of the transmit array and (b) preventing other wavelengths from substantially affecting the emitters of the transmit array.

25. (amended) The station of claim 17 wherein the optical station includes a transmit array and a receive array, the transmit and receive arrays being at different locations so that photons emitted from the transmit array of the optical station do not interfere with detectors of the receive array at the station.

26. (amended) The station of claim 17 wherein the optical station includes a transmit array and a receive array, the transmit and receive arrays each being associated with plural beams, some of the plural beams being arranged to be coupled with more than one of the other optical stations of the network.

28. (amended) The station of claim 17 wherein each beam incident on the optical station includes rays that are essentially parallel, the optical station including (a) an array of optical detectors arranged in detector areas and (b) an optical arrangement for focusing each beam on one of the detector areas.

29. (amended) The station of claim 17 wherein each optical station includes a transmit array of optical emitters for emitting optical beams, and an optical

arrangement for causing each beam to diverge slightly as it propagates in free space, the emitters and optical arrangement being arranged so that beams derived from different emitters of the transmit array can propagate to different optical stations of the network.

30. (amended) The station of claim 17 including a receive array having many avalanche photodiodes.

31. (amended) The station of claim 17 further including a transmit array including many optical emitters each having an associated beam, and a receive array including many optical detector areas each having an associated beam, the beam of a detector area of the station corresponding with the beam of an emitter of a transmitting optical station of the network, the transmitting optical station being different from the station of claim 17.

REMARKS

Claims 4-10, 12-16, 20-26 and 28-31 have been amended to eliminate the multiple dependency thereof.

Entry of the amendment is respectfully requested and in order.

Respectfully submitted,

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MARKED-UP VERSION SHOWING CHANGES:

4. The network of [any of claims 1-3] claim 1 wherein at least one of the plural optical stations is a relay station for (a) detecting the destination station identifier in messages that the relay station receives, and (b) relaying the message toward the destination station in response to the detected identifier, the relay station being incapable of responding to the data portion of the message.

5. The network of [any of claims 1-4] claim 1 wherein at least some of the plural optical stations arranged for performing (a), (b) and (c) are end user stations.

6. The network of [any of claims 1-5] claim 1 wherein some of the optical stations are mobile.

7. The network of [any of claims 1-6] claim 1 wherein each of the optical stations is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, each of the optical stations including a receive array associated with or without a filter arrangement for passing the wavelength to detectors of the receive array and preventing other wavelengths from substantially affecting the detectors of the receive array.

8. The network of [any of claims 1-7] claim 1 wherein each of the optical stations is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, each of the optical stations including a transmit array associated with a filter arrangement for (a) passing the wavelength to free space from emitters of the transmit array and (b) preventing other wavelengths from substantially affecting the emitters of the transmit array.

9. The network of [any of claims 1-8] claim 1 wherein each of the optical stations includes a transmit array and a receive array, the transmit and receive

arrays of a particular optical station being at different locations so that photons emitted from the transmit array at the particular optical station do not interfere with signals arriving at detectors of the receive array at the particular optical station.

10. The network of [any of claims 1-9] claim 1 wherein each of the optical stations includes a transmitter array and a receive array, the transmit and receive arrays at any particular optical station being associated with plural beams, some of the plural beams of one optical station being arranged to be coupled with more than one of the other optical stations of the network.

12. The network of [any of claims 1-11] claim 1 wherein the optical stations are arranged so there are plural optical links among some of the optical stations, each of the plural optical links between some of the optical stations including different intermediate optical stations for relaying messages from an originating optical station to a designated destination optical station.

13. The network of [any of claims 1-12] claim 1 wherein the optical stations are arranged so each beam incident on a receiving optical station includes rays essentially parallel, each optical station including (a) an array of optical detectors arranged in detector areas and (b) an optical element for focusing each beam incident on one detector area of the receiving optical station.

14. The network of [any of claims 1-13] claim 1 wherein each optical station includes a transmit array of optical emitters for emitting optical beams, and an optical element for causing each emitted beam to diverge slightly as it travels through free space, the emitters and optical arrangement being arranged so that beams derived from different emitters of the same emitting array can propagate to different optical receiving stations.

15. The network of [any of claims 1-14] claim 1 wherein each optical

station includes a receive array having many avalanche photodiodes.

16. The network of [any of claims 1-15] claim 1 wherein each optical station includes a transmit array including many optical emitters each having an associated beam and a receive array including many optical detector areas each having an associated beam, the beam of a detector area of a receiver optical station corresponding with the beam of an emitter of transmitter optical station.

20. The station of [any of claims 17-19] claim 17 wherein the optical station is a relay station for (a) detecting if the destination station identifier in messages that the relay station receives.

21. The station of [any of claims 17-19] claim 17 wherein the optical station is an end user station.

22. The station of [any of claims 17-19 or 21] claim 17 wherein the optical station is mobile.

23. The station of [any of claims 17-22] claim 17 wherein the optical station is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, the optical station including a receive array associated with a filter arrangement for passing the wavelength to detectors of the receive array and preventing other wavelengths from substantially affecting the detectors of the receive array.

24. The station of [any of claims 17-23] claim 17 wherein the optical station is arranged for transmitting each message on a monochromatic carrier having a particular wavelength, the optical station including a transmit array associated with a filter arrangement for (a) passing the wavelength to free space from emitters of the transmit array and (b) preventing other wavelengths from substantially affecting the emitters of the transmit array.

25. The station of [any of claims 17-24] claim 17 wherein the optical station includes a transmit array and a receive array, the transmit and receive arrays being at different locations so that photons emitted from the transmit array of the optical station do not interfere with detectors of the receive array at the station.

26. The station of [any of claims 17-25] claim 17 wherein the optical station includes a transmit array and a receive array, the transmit and receive arrays each being associated with plural beams, some of the plural beams being arranged to be coupled with more than one of the other optical stations of the network.

28. The station of [any of claims 17-27] claim 17 wherein each beam incident on the optical station includes rays that are essentially parallel, the optical station including (a) an array of optical detectors arranged in detector areas and (b) an optical arrangement for focusing each beam on one of the detector areas.

29. The station of [any of claims 17-28] claim 17 wherein each optical station includes a transmit array of optical emitters for emitting optical beams, and an optical arrangement for causing each beam to diverge slightly as it propagates in free space, the emitters and optical arrangement being arranged so that beams derived from different emitters of the transmit array can propagate to different optical stations of the network.

30. The station of [any of claims 17-29] claim 17 including a receive array having many avalanche photodiodes.

31. The station of [any of claims 17-30] claim 17 further including a transmit array including many optical emitters each having an associated beam, and a receive array including many optical detector areas each having an associated beam, the beam of a detector area of the station corresponding with the beam of an emitter of a transmitting optical station of the network, the transmitting optical station

[illegible]